

E14
Amended

40. (Amended) The organic EL device as claimed in claim 36, the first, second and third colors being red, green and blue, respectively.

REMARKS

Claims 1-40 are pending. By this Amendment, claims 1-40 are amended.

Reconsideration based on the above amendments and following remarks is respectfully requested.

Entry of the amendments is proper under 37 C.F.R. §1.116 since the amendments:

(a) place the application in condition for allowance (for the reasons discussed herein); (b) do not raise any new issue requiring further search and/or consideration (since the amendments amplify issues previously discussed throughout prosecution); (c) satisfy a requirement of form asserted in the previous Office Action; and (d) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

In the Advisory Action mailed on January 14, 2002, Examiner Tarazano asserts that claim amendments of the December 26, 2001 Amendment After Final Rejection Under 37 CFR §1.116 impermissibly add new matter. Specifically, Examiner Tarazano asserts that the recitation of "at least one luminescent layer remains static relative to the first electrodes" constitutes new matter.

This assertion is respectfully traversed. It is respectfully submitted that the above recitation is clearly supported by the original disclosure as filed. However, in order to expedite prosecution of this application, the above recitation is deleted. This deletion is not intended as an admission that the above recitation constitutes new matter.

I. The Claims Satisfy the Requirements of 35 U.S.C. §112, Second Paragraph

The Office Action rejects claims 26-29 under 35 U.S.C. §112, second paragraph, as indefinite. Claims 26-29 are amended to obviate the rejection. Withdrawal of the rejection under 35 U.S.C. §112, second paragraph, is respectfully requested.

II. The Claims Define Allowable Subject Matter

The Office Action rejects claims 1-3, 5, 6, 9, 11-15, 17-21, 23-33 and 36-40 under 35 U.S.C. §102(e) as unpatentable over U.S. Patent No. 5,895,692 to Shirasaki et al. (hereinafter "Shirasaki"); claims 10, 22, 34 and 35 under 35 U.S.C. §103 as unpatentable over Shirasaki; claims 4 and 16 under 35 U.S.C. §103 as unpatentable over Shirasaki in view of U.S. Patent No. 5,317,169 to Nakano et al. (hereinafter "Nakano"); and claims 7, 8, 19, 20 and 28 under 35 U.S.C. §103 as unpatentable over Shirasaki in view of U.S. Patent No. 6,013,982 to Thompson et al. (hereinafter "Thompson"). The rejections are respectfully traversed.

In Shirasaki et al., after the fluorescent pigments (R, G, B) are applied on the hole transport layer 16 by the ink-jet method, the luminescent layers 13a, 13b and 13c are formed through (by way of) the diffusion step (the fluorescent pigments are heated to be diffused). The shape and position of the final luminescent layers 13a, 13b and 13c are not yet finally fixed at the time when the fluorescent pigment (R, G, B) layers have been formed by the ink-jet method. In more detail, the fluorescent pigments (R, G, B) diffuse or spread not only horizontally but also vertically after they are formed by the ink-jet method due to the diffusion step.

Therefore, the fluorescent pigments (R, G, B) which are formed by the ink-jet method do not constitute a final pattern like the claimed invention. In other words, the fluorescent pigments (three kinds of pigment) (R, G, B) are different from the luminescent layers 13a, 13b and 13c of the claimed invention in their shapes and positions.

In contrast, in accordance with the claimed invention, the materials discharged by the ink-jet method (or discharged from the nozzle) form a final pattern (respective pixel luminescent layers of the luminescent layer have a predetermined shape and are arranged in a predetermined

order) of pixel luminescent layers substantially at those positions (that is, respective pixel luminescent layers of the luminescent layer have a predetermined shape and are arranged in a predetermined order).

In fact, the independent claims recite that the formation of the luminescent layer is formed by discharging a composition at least a part of which becomes the luminescent layer from a nozzle toward a substrate and onto an underlying layer so as to form the luminescent layer on the underlying layer, the underlying layer constituting a different layer relative to the luminescent layer. These features are clearly supported by the process shown in Figure 1, for example.

Shirasaki clearly does not disclose these features. Instead, in Shirasaki, the fluorescent pigments R, G, B are discharged onto the single hole transport layer 16. The single hole transport layer 16 does not constitute a separate layer relative to the red, green and blue luminescent portions 13a, 13b, 13c.

Nagano does not make up for the deficiencies discussed above.

Further, Thompson does not even constitute prior art. For example, the Japanese patent application from which this application claims priority was filed on November 25, 1996, which predates the effective prior art date of Thompson.

For at least these reasons, it is respectfully submitted that the claims are distinguishable over the applied art. Withdrawal of the rejections under 35 U.S.C. §102 and §103 is respectfully requested.

III. Conclusion

For at least the reasons discussed above, it is respectfully submitted that this application is in condition for allowance.

Should the Examiner believe that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed above.

Respectfully submitted,



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Attachments:

Appendix
Petition for Extension of Time

Date: January 24, 2002

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**DEPOSIT ACCOUNT USE
AUTHORIZATION**

Please grant any extension
necessary for entry;
Charge any fee due to our
Deposit Account No. 15-0461

APPENDIX

Changes to Claims:

The following are marked-up versions of the amended claims:

1. (Twice Amended) A method of manufacturing an organic EL ~~element~~device, comprising the steps of:
 - forming ~~pixel~~first electrodes on or above a ~~transparent~~ substrate;
 - forming at least one luminescent layer having a certain color and made of an organic compound on or above ~~predetermined pixel~~first electrodes ~~in the pixel electrodes~~ by patterning, said at least one luminescent layer including a plurality of pixel luminescent layers respectively provided on or above the predetermined ~~pixel~~first electrodes; and
 - forming a ~~counter~~second electrode opposing the ~~pixel~~first electrodes,

~~wherein~~ the formation of said at least one luminescent layer ~~is being~~ performed by means of an ink-jet method so that a thus formed luminescent layer can be used as a final pattern in which the respective pixel luminescent layers of the luminescent layer have a predetermined shape and are arranged in a predetermined order, the formation of the at least one luminescent layer being performed by discharging a composition at least a part of which becomes the at least one luminescent layer from a nozzle toward the substrate and onto an underlying layer so as to form the at least one luminescent layer on the underlying layer, the underlying layer constituting a different layer relative to the at least one luminescent layer.
2. (Amended) The method of manufacturing an organic EL ~~element~~device as claimed in claim 1, ~~wherein~~ the organic compound ~~is being~~ a polymer organic compound.
3. (Twice Amended) The method of manufacturing an organic EL element as claimed in claim 2, ~~wherein~~ the polymer organic compound ~~is being~~ a material having functions of hole injection and hole transfer.

4. (Twice Amended) The method of manufacturing an organic EL ~~element~~device as claimed in claim 2, ~~wherein~~ the polymer organic compound ~~is~~being a polyparaphenylene vinylene or its derivative or a copolymer which contains at least either one of these compounds.

5. (Three Times ~~Twice~~-Amended) The method of manufacturing an organic EL ~~element~~device as claimed in claim 1, ~~wherein~~ said at least one luminescent layer includes three types of luminescent layers having different colors, and wherein at least two types of luminescent layers in the three types of luminescent layers ~~are~~being formed by patterning by means of the ink-jet method.

6. (Twice Amended) The method of manufacturing an organic EL ~~element~~device as claimed in claim 5, ~~wherein~~ said different colors include red, green and blue, and the red luminescent layer and the green luminescent layer ~~are~~being formed by patterning by means of the ink-jet method.

7. (Amended) The method of manufacturing an organic EL ~~element~~device as claimed in claim 6, ~~wherein~~ the blue luminescent layer ~~is~~being formed by a vacuum deposition method.

8. (Twice Amended) The method of manufacturing an organic EL ~~element~~device as claimed in claim 7, ~~wherein~~ the blue luminescent layer ~~is~~being made of a material having functions of electron injection and electron transfer.

9. (Three Times ~~Twice~~-Amended) The method of manufacturing an organic EL ~~element~~device as claimed in claim 1, ~~wherein~~ said at least one luminescent layer ~~is laminated onto~~being formed on or above a hole injection and transfer layer.

10. (Three Times ~~Twice~~-Amended) The method of manufacturing an organic EL element as claimed in claim 1, further comprising the step of forming a protective film on or above the ~~counter~~second electrode.

11. (~~Three Times~~ Twice Amended) The method of manufacturing an organic EL ~~element~~ device as claimed in claim 1, further comprising the step of forming on or above said ~~transparent~~ substrate electrodes for driving the respective pixels.

12. (Twice Amended) The method of manufacturing an organic EL ~~element~~ device as claimed in claim 1, ~~wherein~~ said pixel-first electrodes ~~are being~~ transparent pixel-first electrodes.

13. (Twice Amended) An organic EL ~~element~~ device manufactured via a nozzle, comprising:

a ~~transparent~~ substrate;

pixel-first electrodes provided on or above the ~~transparent~~ substrate;

an underlying layer;

at least one luminescent layerslayer, each of which includes a plurality of pixel luminescent layers respectively formed on or above predetermined pixel-first electrodes ~~in the pixel-electrodes~~ and each of which has a certain color and is made of an organic compound, ~~wherein at least one of the luminescent layers is being formed on or above the predetermined pixel-first electrodes~~ by patterning by means of an ink-jet system so that a thus formed luminescent layer can be used as a final pattern in which the respective pixel luminescent layers of the luminescent layer have a predetermined shape and are arranged in a predetermined order, the formation of the at least one luminescent layer being performed by discharging a composition at least a part of which becomes the at least one luminescent layer from the nozzle toward the substrate and onto the underlying layer so as to form the at least one luminescent layer on the underlying layer, the underlying layer constituting a different layer relative to the at least one luminescent layer; and

a ~~counter-second~~ electrode formed on or above the luminescent layers.

14. (Amended) The organic EL ~~element~~device, as claimed in claim 13, ~~wherein~~ the organic compound ~~is being~~ a polymer organic compound.

15. (Twice Amended) The organic EL ~~element~~device as claimed in claim 14, ~~wherein~~ the polymer organic compound ~~is being~~ a material having functions of hole injection and hole transfer.

16. (Twice Amended) The organic EL ~~element~~device as claimed in claim 14, wherein the polymer organic compound ~~is being~~ a polyparaphenylene vinylene or its derivative or a copolymer which contains at least either one of these compounds.

17. (Three Times ~~Twice~~ Amended) The organic EL ~~element~~device as claimed in claim 13, ~~wherein~~ said at least one luminescent layer comprises three luminescent layers having different colors, and at least two luminescent layers in the three luminescent layers ~~are being~~ formed by patterning by means of an ink-jet method.

18. (Twice Amended) The organic EL ~~element~~device as claimed in claim 17, ~~wherein~~ said different colors include red, green and blue, and the red luminescent layer and the green luminescent layer ~~are being~~ patterned by means of the ink-jet method.

19. (Twice Amended) The organic EL ~~element~~device as claimed in claim 13, wherein the blue luminescent layer is formed by a vacuum deposition method.

20. (Twice Amended) The organic EL ~~element~~device as claimed in claim 19, ~~wherein~~ the blue luminescent layer ~~is being~~ made of a material having functions of electron injection and electron transfer.

21. (Three Times ~~Twice~~ Amended) The organic EL ~~element~~device as claimed in claim 13, ~~wherein~~ said at least one luminescent layer ~~is laminated onto~~ being formed on or above a material having functions of electron injection and electron transfer.

22. (~~Three Times Twice~~-Amended) The organic EL ~~element device~~ as claimed in claim 13, further comprising a protective film formed on or above the ~~counter-second~~ electrode.

23. (~~Twice~~ Amended) The organic EL ~~element device~~ as claimed in claim 13, ~~wherein said pixel-first electrodes are being~~ transparent ~~pixel-first~~ electrodes.

24. (~~Twice~~ Amended) ~~An organic EL A display device~~ comprising the organic EL ~~element device~~ as claimed in claim 23.

25. (~~Amended~~) A method of manufacturing an organic EL ~~element device~~, comprising the steps of:

forming ~~pixel-first~~ electrodes on or above a ~~transparent~~ substrate;

forming three types of luminescent layers on or above said ~~pixel-first~~ electrodes by patterning, each of said luminescent layers having a certain color and made of an organic compound, and ~~wherein each of the luminescent layers includes including~~ respectively a plurality of pixel luminescent layers formed on or above predetermined ~~pixel-first electrodes in the pixel electrodes~~; and

forming a ~~counter-second~~ electrode opposing the ~~pixel-first~~ electrodes,

~~wherein the formation of the~~ at least two of the luminescent layers ~~is being~~ performed by means of an ink-jet method so that thus formed luminescent layers can be used as a final pattern in which the respective pixel luminescent layers of the luminescent layers have substantially a predetermined shape and are arranged in a predetermined order, the formation of the at least two of the luminescent layers being performed by discharging a composition at least a part of which becomes the at least two of the luminescent layers from a nozzle toward the substrate and onto an underlying layer so as to form the at least two of the luminescent layers on the underlying layer, the underlying layer constituting a different layer relative to the at least two of the luminescent layers.

26. (Amended) The ~~organic EL element method~~ as claimed in claim 25, ~~wherein~~ said three luminescent layers have three different colors, respectively, and at least two luminescent layers in the three luminescent layers ~~are being~~ formed by patterning by means of the ink-jet method.

27. (Amended) The ~~organic EL element method~~ as claimed in claim 26, ~~wherein~~ said three different colors include red, green and blue, and the red luminescent layer and the green luminescent layer ~~are being~~ patterned by means of the ink-jet method.

28. (Amended) The ~~organic EL element method~~ as claimed in claim 27, ~~wherein~~ the blue luminescent layer ~~is being~~ formed by a vacuum deposition method.

29. (Amended) The ~~organic EL element method~~ as claimed in claim 27, ~~wherein~~ the blue luminescent layer ~~is being~~ formed by means of the ink-jet method.

30. (Amended) A method of manufacturing an organic EL ~~element device~~, comprising the steps of:

forming ~~pixel-first~~ electrodes on or above a ~~transparent~~ substrate;

forming a first luminescent ~~layers-layer~~ having a first color and made of a first organic compound ~~on or above~~ first predetermined ~~pixel-first~~ electrodes ~~in the pixel-electrodes, respectively,~~ by patterning; and

forming a ~~counter-second~~ electrode opposing the ~~pixel-first~~ electrodes,

~~wherein the formation of said first luminescent layers is layer being performed~~ by means of an ink-jet method so that thus formed luminescent ~~layers-layer~~ can be used as a final pattern in which the ~~respective luminescent layers-layer on or above~~ the predetermined ~~pixel-first~~ electrodes ~~have has~~ substantially a predetermined shape and ~~are is~~ arranged in a predetermined order, the formation of the at least one luminescent layer being performed by discharging a composition at least a part of which becomes the at least one luminescent layer from a nozzle toward the substrate and onto an underlying layer so as to form the at least one

luminescent layer on the underlying layer, the underlying layer constituting a different layer relative to the at least one luminescent layer.

31. (Amended) The method as claimed in claim 30, further comprising a step of forming a second luminescent layers-layer having a second color which is different from the first color and made of a second organic compound on or above second predetermined ~~pixel-first~~ electrodes in the ~~pixel-first~~ electrodes, respectively, by patterning,

~~wherein~~ the formation of said second luminescent ~~layers-layer~~ is performed by means of the ink-jet method so that thus formed second luminescent ~~layers-layer~~ can be used as a final pattern in which the respective second luminescent layers on or above the respective second ~~pixel-first~~ electrodes have a predetermined shape and ~~are~~ is arranged in a predetermined order.

32. (Amended) The method as claimed in claim 31, further comprising a step of forming third luminescent ~~layers-layer~~ having a third color that is different from the first and second colors and made of a third organic compound on or above third predetermined ~~pixel-first~~ electrodes in the ~~pixel-first~~ electrodes, respectively, ~~wherein~~ the formation of the third luminescent ~~layers~~ is-layer being carried out by the ink-jet method.

33. (Amended) The method as claimed in claim 31, further comprising a step of forming a third luminescent layers-layer having a third color which is different from the first and second colors and made of a third organic compound on or above third predetermined ~~pixel-first~~ electrodes in the ~~pixel-first~~ electrodes, respectively, ~~wherein~~ the formation of the third luminescent layers is-being carried out by a coating method.

34. (Amended) The method as claimed in claim 32, ~~wherein~~ the first, second and third colors are red, green and blue, respectively.

35. (Amended) The method as claimed in claim 33, ~~wherein~~ the first, second and third colors are red, green and blue, respectively.

36. (Amended) An organic EL ~~element~~ device manufactured via a nozzle, comprising:

a ~~transparent~~ substrate;

~~pixel-first~~ electrodes provided on or above the transparent substrate, said ~~pixel-first~~ electrodes include first ~~pixel-first~~ electrodes, second ~~pixel-first~~ electrodes and third ~~pixel-first~~ electrodes that are arranged in a predetermined order;

an underlying layer;

first, second and third luminescent layers respectively formed on or above the first, second and third predetermined ~~pixel-first~~ electrodes, in which said first, second and third luminescent layers have first, second and third colors, respectively, and are made of first, second and third organic compounds, respectively, ~~wherein~~ at least the first luminescent ~~layers are layer~~ formed on or above the ~~respective first pixel-first~~ electrodes by patterning by means of an ink-jet system so that thus formed first luminescent ~~layers layer~~ can be used as a final pattern in which the respective first luminescent layers on or above the ~~respective first pixel-first~~ electrodes have a predetermined shape and are arranged in a predetermined order, the formation of the first luminescent layer being performed by discharging a composition at least a part of which becomes the first luminescent layer from the nozzle toward the substrate and onto the underlying layer so as to form the first luminescent layer on the underlying layer, the underlying layer constituting a different layer relative to the first luminescent layer; and

a ~~counter-second~~ electrode formed on or above the luminescent layers.

37. (Amended) The organic EL ~~element~~ device as claimed in claim 36, ~~wherein~~ the formation of said second luminescent ~~layers is layer being~~ performed by means of the ink-jet system so that thus formed second luminescent layers can be used as a final pattern in which the respective luminescent ~~layers layer~~ on or above the respective second ~~pixel-first~~

electrodes have substantially a predetermined shape and are arranged in a predetermined order.

38. (Amended) The organic EL ~~element-device~~ as claimed in claim 36, ~~wherein~~ the formation of the third luminescent ~~layers is~~ layer being carried out by the ink-jet system.

39. (Amended) The organic EL ~~element-device~~ as claimed in claim 36, ~~wherein~~ the formation of the third luminescent ~~layers is~~ layer being carried out by a coating method.

40. (Amended) The organic EL ~~element-device~~ as claimed in claim 36, ~~wherein~~ the first, second and third colors ~~are~~ being red, green and blue, respectively.